



**Defense Nuclear Agency
Alexandria, VA 22310-3398**



DNA-TR-96-33

Tri-Service Thermal Radiation Test Facility Technical Support Plan (TSP) Instructions

**Nicholas J. Olson
University of Dayton Rsch Inst
300 College Park Avenue
Dayton, OH 45469-0135**

June 1997

Technical Report

CONTRACT No. DNA 001-90-C-0081

Approved for public release;
distribution is unlimited.

19970618 048

DESTRUCTION NOTICE:

Destroy this report when it is no longer needed.
Do not return to sender.

PLEASE NOTIFY THE DEFENSE SPECIAL WEAPONS
AGENCY, ATTN: CSTI, 6801 TELEGRAPH ROAD,
ALEXANDRIA, VA 22310-3398, IF YOUR ADDRESS IS
INCORRECT, IF YOU WISH IT DELETED FROM THE
DISTRIBUTION LIST, OR IF THE ADDRESSEE IS NO
LONGER EMPLOYED BY YOUR ORGANIZATION.



DISTRIBUTION LIST UPDATE

This mailer is provided to enable DSWA to maintain current distribution lists for reports. (We would appreciate your providing the requested information.)

- ☐ Add the individual listed to your distribution list.
- ☐ Delete the cited organization/individual.
- ☐ Change of address.

NOTE:

Please return the mailing label from the document so that any additions, changes, corrections or deletions can be made easily. For distribution cancellation or more information call DSWA/IMAS (703) 325-1036.

NAME: _____

ORGANIZATION: _____

OLD ADDRESS

CURRENT ADDRESS

TELEPHONE NUMBER: () _____

DSWA PUBLICATION NUMBER/TITLE

CHANGES/DELETIONS/ADDITIONS, etc.) (Attach Sheet if more Space is Required)

DSWA OR OTHER GOVERNMENT CONTRACT NUMBER: _____

CERTIFICATION OF NEED-TO-KNOW BY GOVERNMENT SPONSOR (if other than DSWA):

SPONSORING ORGANIZATION: _____

CONTRACTING OFFICER OR REPRESENTATIVE: _____

SIGNATURE: _____

CUT HERE AND RETURN



DEFENSE SPECIAL WEAPONS AGENCY
ATTN: IMAS
6801 TELEGRAPH ROAD
ALEXANDRIA, VA 22310-3398

DEFENSE SPECIAL WEAPONS AGENCY
ATTN: IMAS
6801 TELEGRAPH ROAD
ALEXANDRIA, VA 22310-3398

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services Directorate for information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.				
1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE 970601	3. REPORT TYPE AND DATES COVERED Technical 910426 – 940717		
4. TITLE AND SUBTITLE Tri-Service Thermal Radiation Test Facility Technical Support Plan (TSP) Instructions		5. FUNDING NUMBERS C - DNA 001-90-C-0081 PE - 62715H PR - RG TA - RR WU - DH307290		
6. AUTHOR(S) Nicholas J. Olson				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) University of Dayton Rsch Inst 300 College Park Avenue Dayton, OH 45469-0135		8. PERFORMING ORGANIZATION REPORT NUMBER UDR-TR-94-70		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Defense Special Weapons Agency 6801 Telegraph Road Alexandria, VA 22310-3398 EST\Chivers		10. SPONSORING/MONITORING AGENCY REPORT NUMBER DNA-TR-96-33		
11. SUPPLEMENTARY NOTES This work was sponsored by the Defense Special Weapons Agency under RDT&E RMC Code B4662D RG RR 00034 TDTR 5200A AB 25904D.				
12a. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) Requirements for detailed test planning, facility and personnel safety, and security requirements to be followed in using the Tri-Service Thermal Radiation Test Facility (TRTF) are described in this technical support document. Details of proposed testing including the anticipated number of tests, requested instrumentation, required thermal, aerodynamic, and mechanical load test loads, and potential hazards are addressed. Standard operating procedures for personnel safety during occupation and testing in the TRTF are also detailed. Requirements for reviewing all Material Safety Data Sheets prior to testing, indoctrination of all personnel in safe operating procedures of thermal energy sources and high pressure gases. Evacuation alarms, emergency exits and evacuation procedures are also described. Personal protection, i.e. safety glasses, other eye and ear protection, protective clothing, are also discussed. Required TRTF visit request forms for both unclassified testing and classified materials testing, and the procedures to be followed are also contained herein.				
14. SUBJECT TERMS Test Plan Eye and Ear Protection Instrumentation Safe Operating Procedures Visit Requests Thermal Sources Material Safety Data Sheets Personnel Safety			15. NUMBER OF PAGES 38	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT SAR	

CLASSIFIED BY:

N/A since Unclassified.

DECLASSIFY ON:

N/A since Unclassified.

**TECHNICAL SUPPORT PLAN (TSP) INSTRUCTIONS
TRI-SERVICE THERMAL RADIATION TESTING
DEFENSE NUCLEAR AGENCY (DNA)**

1. PURPOSE:

The Technical Support Plan (TSP) describes the level of effort required from DNA to support an experiment at the Tri-Service Thermal Radiation Test Facility (TTRTF). It is a detailed experiment description which allows for review of all MSDS, test objectives and instrumentation requirements.

2. DESCRIPTION:

a. The TSP is divided into three sections, A through C. You must complete each section or mark as "Not Applicable". Instructions for completing each section are provided where applicable.

b. Provide the Facility Test Manager (FTM) one copy of your completed TSP. One copy of any revised TSP must be provided to the FTM. Upon approval by the FTM, a copy of the Test Plan will be returned to you. No action will be taken on incomplete TSPs or on TSPs that have been disapproved.

c. For any revision to a TSP, a new table of contents and any revised sections must be provided.

d. ALL REVISIONS REQUIRE A NEW TSP APPROVAL.

TABLE OF CONTENTS INSTRUCTIONS

1. INDEX BLOCK

- a. Enter the name of the organization for whom the tests are being performed.
- b. Enter the appropriate contract number.
- c. Enter the original TSP submission date.
- d. Enter the revision number.

2. TABLE OF CONTENTS

- a. Original submission
 - 1. Enter "ORIGINAL" under REVISION for all sections, or
 - 2. Enter "N/A" for those sections which do not apply
- b. Revisions
 - 1. For each section being revised, enter revision number and date.

TECHNICAL SUPPORT PLAN
INDEX BLOCK

ORGANIZATION _____
CONTRACT NUMBER _____
DATE _____
REVISION NUMBER _____

TECHNICAL SUPPORT PLAN
TABLE OF CONTENTS

<u>SECTION</u>	<u>REVISION</u>	<u>DATE</u>
SECTION A - TEST PLAN		
SECTION B - SAFETY		
B.1 Standard Operating Procedures for Laboratory Safety		
B.2 Tri-Service Thermal Radiation Test Facility		
B.3 Classification of Hazardous Materials		
SECTION C - SECURITY		

INSTRUCTIONS: SECTION A
TEST PLAN

- Block 1. Enter the agency(s) name primarily responsible for fielding the experiment.
- Block 2. Enter valid Contract Number under which this work will be completed.
- Block 3. Enter an UNCLASSIFIED title for the experiment.
- Block 4. Enter the revision number of this Test Plan. The initial submission is "ORIG", subsequent submissions are "1", "2", etc.
- Block 5. Enter the effective date of this revision.
- Block 6. Enter the total number of samples to be tested.
- Block 7. Enter the total number of tests to be completed.
- Block 8. Enter the types and numbers of instrumentation installed on the test samples (thermocouples and strain gages).
- Block 9. Enter the type of energy source required (Quartz lamps, Xenon lamps or Vortek).
- Block 10. Enter desired thermal load(s).
- Block 11. Provide a brief description of your experiment whether the experiment is classified and to what level, thermal radiation source, support and orientation, weight and dimensions, and any other data that may be useful in supporting your testing effort. Attach drawings or extra sheets as required. **THIS BLOCK MUST REMAIN UNCLASSIFIED. REFERENCE CLASSIFIED ATTACHMENTS SEPARATELY.**
- Block 12. Enter the type of aerodynamic or mechanical load requirements (windtunnel or tension bending) to be used in conjunction with thermal radiation testing.
- Block 13. Enter any other test requirements (photographs, sample weights and measurements).
- Block 14. List all hazards associated with your experiment, such as pyrotechnics, high voltage/current, batteries, high pressure compressed gases, fuels, radioactive components, lasers, etc. This must agree with your hazards analysis developed separately.
- Block 15. Self-explanatory. The person listed must have the authority to discuss or negotiate any of the items on this Test Plan with the test group staff. Provide

the Project Officer's complete mailing address for film, data and correspondence, including one for classified mail.

Block 16. Leave blank.

SECTION A: TEST PLAN

1. SPONSORING AGENCY		2. CONTRACT NUMBER		3. EXPERIMENT TITLE	
4. REVISION	5. DATE	6. TOTAL NUMBER OF SAMPLES		7. TOTAL NUMBER OF TESTS	
8. TYPE AND NUMBER OF TRANSDUCERS PER SAMPLE (THERMOCOUPLES, STRAIN GAGES)		9. DESIRED ENERGY SOURCE (QUARTZ LAMPS, XENON LAMPS, VORTEK ARC LAMP)			
10. DESIRED THERMAL LOAD MAXIMUM FLUX MAXIMUM FLUENCE DURATION		11. EXPERIMENT DESCRIPTION			
12. AEROMECHANICAL LOAD REQUIREMENTS (WINDTUNNEL, TENSILE OR BENDING)		14. HAZARDS			
13. OTHER REQUIREMENTS (PHOTOGRAPHIC, WEIGHING, MEASURING)					
15. PROJECT OFFICER (SIGNATURE, AGENCY ADDRESS & PHONE NUMBER)		16. TEST FACILITY MANAGER APPROVAL			

SECTION B - SAFETY

B.1 STANDARD OPERATING PROCEDURES FOR LABORATORY SAFETY

For Testing and General Operations at the Tri-Service Thermal Radiation Test Facility

MANDATORY:

1. No material will be tested before scrutiny of Material Safety Data Sheets and subsequent approval by Facility Manager.
2. Facility visitors will be made aware of Alarms, Exits, Evacuation Procedures, and Safety Operating Procedures.
3. No personnel will occupy Test Areas (Room 710 Quartz Lamp Testing or Room 711 Flashlamp Thermal Simulator/Vortek Arclamp Testing) during tests. Personnel observing tests must be located in Control Rooms 710B or 710C. All other rooms in Building 56, Bay 7 are approved for occupancy during testing (see Figure 1).
4. Facility personnel will adhere to detailed Safety Operating Procedures when accessing area between capacitor banks, inside FTS Head Console or any other capacitor-fed high-voltage area (Room 711).
5. EMERGENCY FIRE/RESCUE DIAL 911 on any Facility phone: state name, type of emergency and location -- that is Building 56, Bay 7, Area B.

GENERAL:

1. Ear protection will be worn when occupying Data-Collection/Control Room (Rooms 710B and 710C) during a test.
2. Eye protection of at least #10 filter will be used to observe test specimens during a test.
3. The direct output of the Flashlamp Thermal Simulator (FTS) and/or the Vortek Stabilized Arclamp (VSAL) should not be viewed regardless of protection.
4. Neck-ties, string-ties, neck scarfs, neck or other loose jewelry and rings will not be worn when working with or around components in the Facility Test Areas or in the Facility Work Shop. Long hair should be kept tied back or bonneted.

HAZARDS:

1. Lethal voltages (480 VAC-Rooms 710 and 711; capacitive discharge-Room 711).
2. High noise levels created by windtunnel and cooling fans.
3. Intense light: Infrared, Visible and Ultraviolet (Rooms 710 and 711).
4. High air and hydraulic pressures (Rooms 710 and 711).
5. Wires and hose equipment connections on floors creating a tripping hazard.
6. High pressure bottled gases (Rooms 711B and 712).

OTHER:

1. Signs will be posted to prevent access to area above the Facility (attic) during testing.
2. All Facility personnel will be qualified in CPR.
3. All gas bottles located in Rooms 711B and 712 will be properly stored and strapped upright.
4. All chemicals and solvents will be properly stored in approved cabinets (Room 708).
5. Emergency Full-Body shower and eye wash are located at the West end of the main hallway (see Figure 1).
6. In the event of building power loss at a time when the capacitor banks contain a charge, all personnel except the operator will vacate the area. Available exits are shown in Figure 1. The operator will remain in the main hallway to prevent access to the capacitor bank area until the bank can be discharged.
7. The use of any tobacco products is not allowed anywhere in the building.

B.2 TRI-SERVICE THERMAL RADIATION TEST FACILITY SAFE OPERATING PRACTICES AND PROCEDURES MANUAL

Safety and Accident Prevention

The Safe Operating Practices and Procedures (SOPP) manual was developed as a guide for all personnel having a need to visit and utilize the Tri-Service Thermal

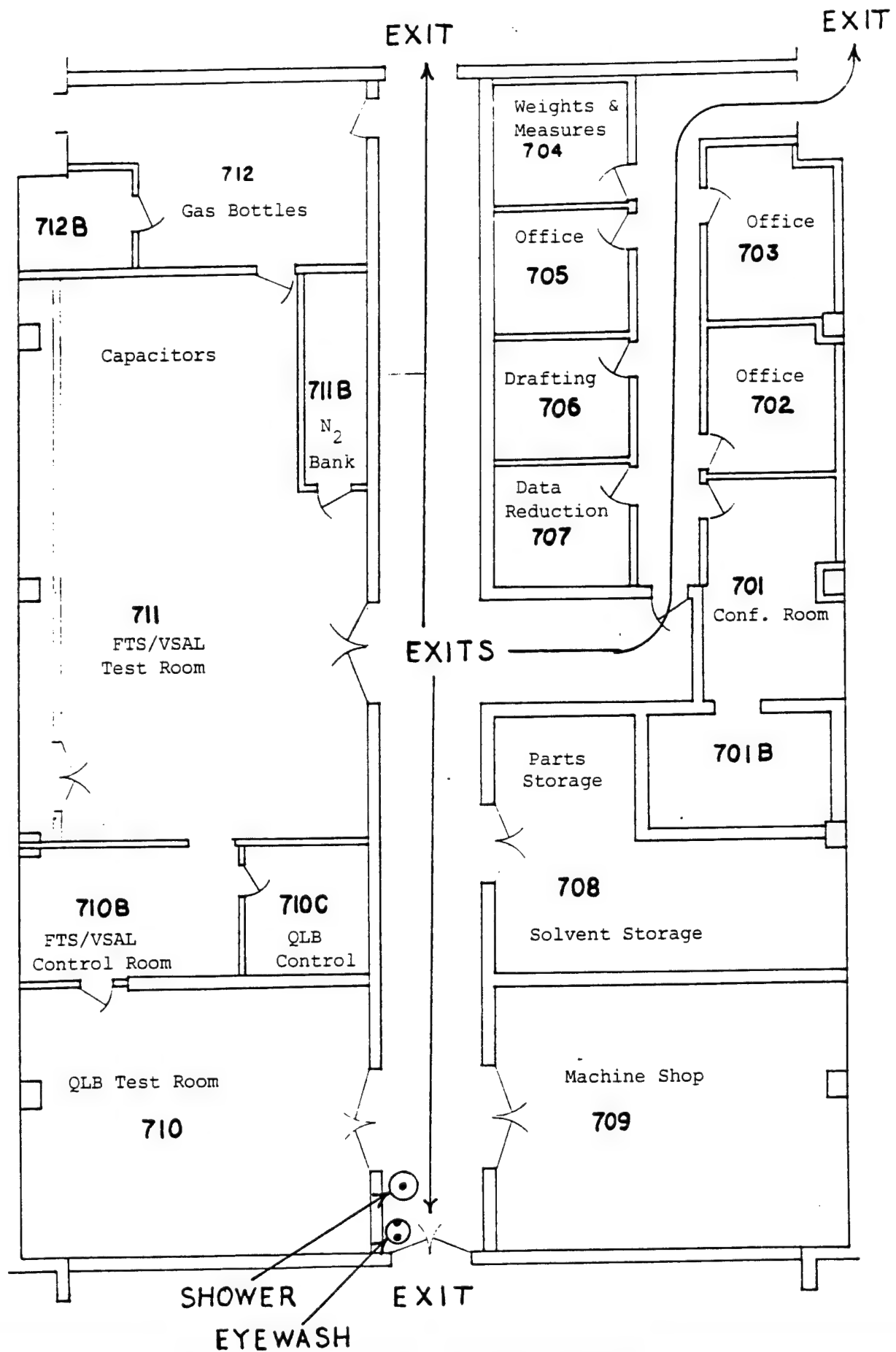


Figure 1. Building 56, Bay 7 Floor Plan.

Radiation Test Facility (TTRTF) in Area B, Building 56, Bay 7, Wright-Patterson AFB, Ohio.

The Air Force Occupational Safety and Health Standards (AFOSH) provides safety procedures governing the location of the TTRTF. In addition, the University of Dayton Environmental Safety/Insurance Office has cognizance over UDRI personnel safety.

This manual addresses specific safety requirements which are unique to the TTRTF and which must be followed to prevent accidents and to preserve the life and health of contractor and government personnel performing or coming in contact with the operation of the TTRTF. Review of the SOPP by all personnel visiting the facility in support of Tri-Service testing is mandatory. A copy of the SOPP with an acknowledgement log is maintained by the TTRTF facility manager.

Common sense and reasonable thought will prevail in all operations of the TTRTF. The purpose of the instructions contained herein is to define, clarify and enhance standard laboratory safe practices and procedures at the TTRTF.

Building Evacuation

The evacuation alarm is an electronic horn located in the center of the main hallway in the Facility. The horn is very loud and can be detected clearly above all combinations of other operating noises at the Facility even when wearing ear protection. When this horn operates, occupants are to leave the building as quickly as possible by the most direct route as determined by the Exit Route Plan (Figure 2). When exiting to the East through the out-opening doors with window, use caution to avoid possible emergency vehicle traffic or other activity. Move North or South on the street in a direction away from the emergency or as official personnel dictate.

When exiting West through the in-opening doors that have no windows, you are entering a hallway that may be blocked by smoke of flame or emergency personnel. Building exit is through the out-opening doors directly across the hallway. Caution should be exercised as you will be on a 12-foot wide loading dock with a 3-1/2 foot drop to the railroad tracks. Leave the dock by the stairs to the South, cross the tracks watching for slow moving railroad traffic and move North or South in a direction away from the emergency as official personnel dictate.

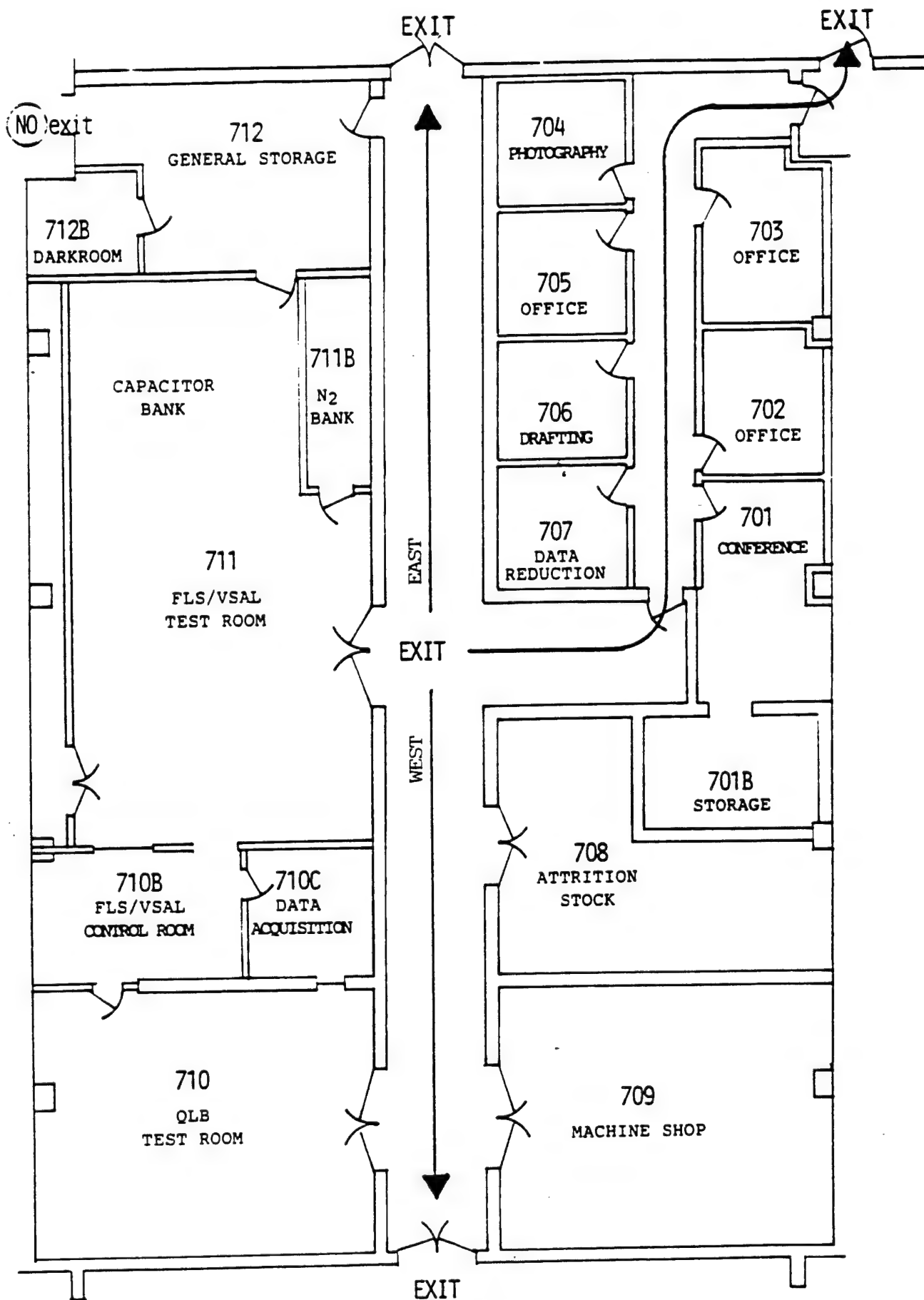


Figure 2. Exit Route Plan.

When exiting through the East and West main hall doors, the Simple X Door Locks (Figure 3) are unlatched by rotating the teardrop-shaped 1-inch long silver latch bottom-to-the-right 45°. The door knobs on either exit door do not need to be turned.

When exiting from the office area through the office exit at the East end of the office hallway, the door opens out into a small alcove. This area may contain personnel exiting from the adjacent Bay. Exit from the alcove through the out-opening door to the left, do not go through the in-opening door across the alcove as it is the exit for the adjoining Bay. When exiting the alcove, you are on the same street as if you had exited through the windowed East main hall door and the same cautions apply.

The point of congregation for all Facility personnel after an emergency evacuation is the South-East corner of 5th street and "G" street (Figure 4). All Facility occupants must quickly move to the congregation point to prevent being listed as "missing." It is the responsibility of the Facility manger or his assigned alternate to determine the safe evacuation of all Facility occupants.

In the case of an emergency that begins in the Facility and requires building evacuation, the evaaacuation alarm buttons (Figure 5) are located to the right of the East main hall exit door and in the outer hallway of the West main hall exit door. The evacuation alarm is self-holding and once initiated can only be extinguished by authorized personnel. The evacuation alarm will sound throughout the entire building.

Fire and Rescue

There are three fire bottles (extinguishers) in the main hallway of the Facility and one fire bottle in each of the two test rooms 710 and 711 (Figure 6). The fire bottles may be used on all classes of fire but if one bottle cannot extinguish the fire an alarm should be sounded. Emergency FIRE and RESCUE is alerted by dialing 911 on any phone that has a dial tone and stating name, type of emergency, and location--

THIS IS BUILDING 56, BAY 7, AREA B

In the event a power loss occurs in the Bay and lighting is lost, emergency lighting will automatically go on and routine building evacuation is carried out. Facility personnel need not proceed to the point of congregation but should gather at one central point, preferably outside the East door.

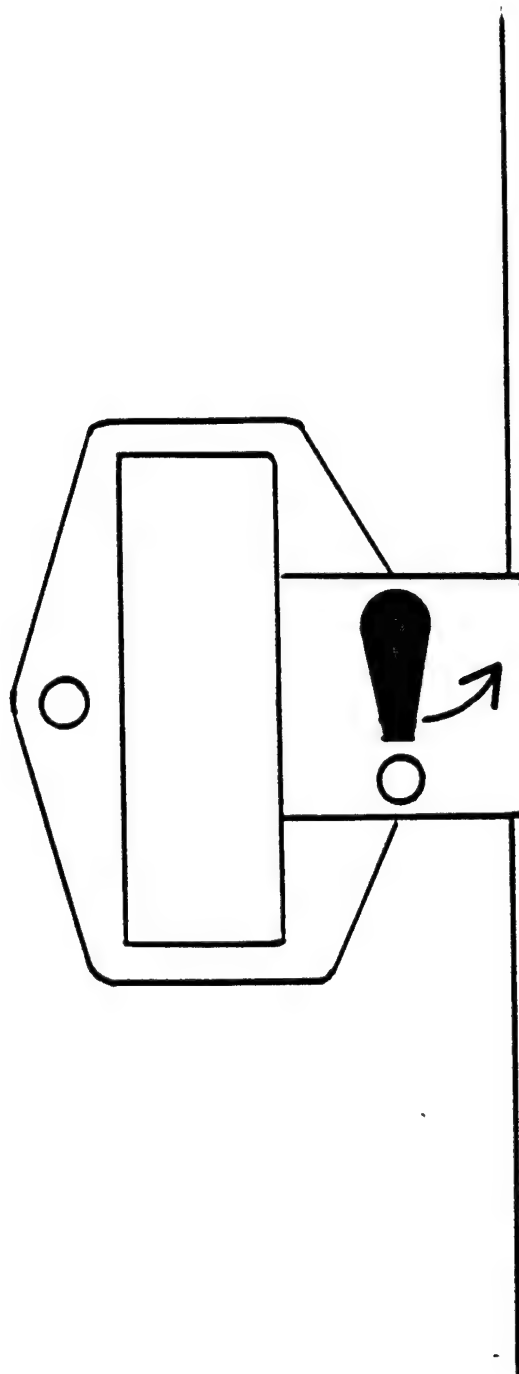
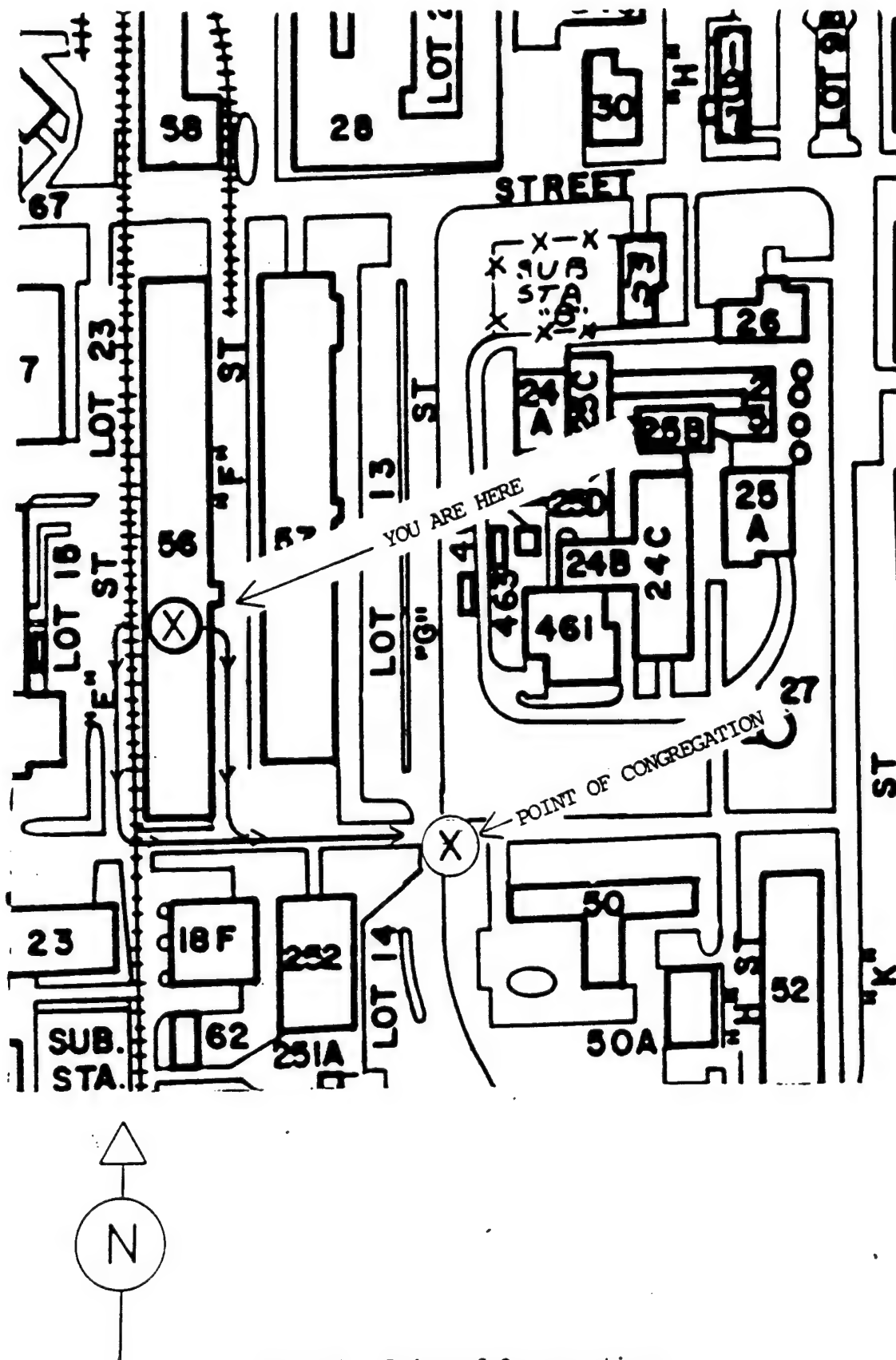


Figure 3. Simplex Door Lock.



THERMAL FLASH TEST FACILITY
Bld. 56, Bay 7

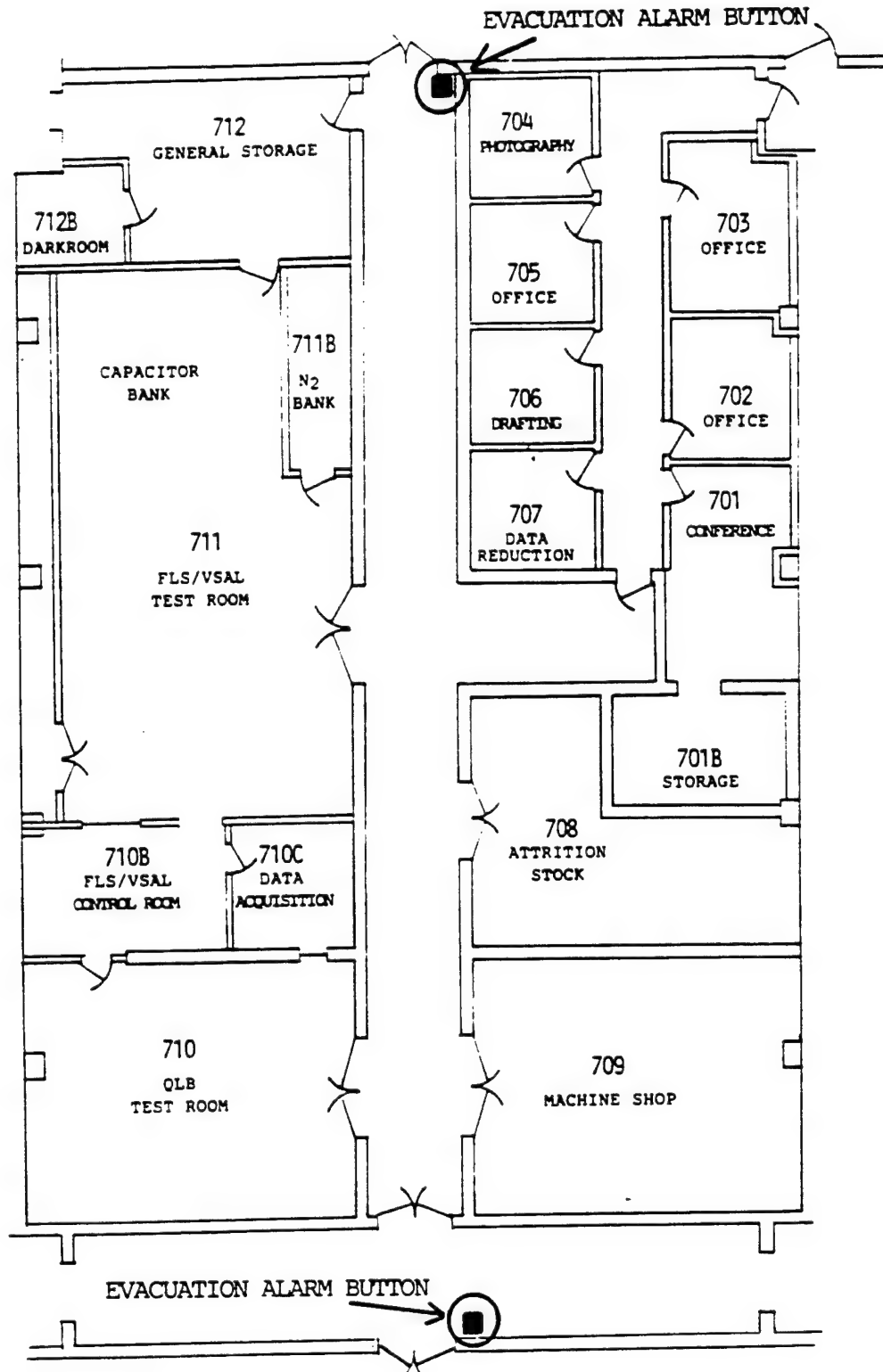


Figure 5. Evacuation Alarm Buttons.

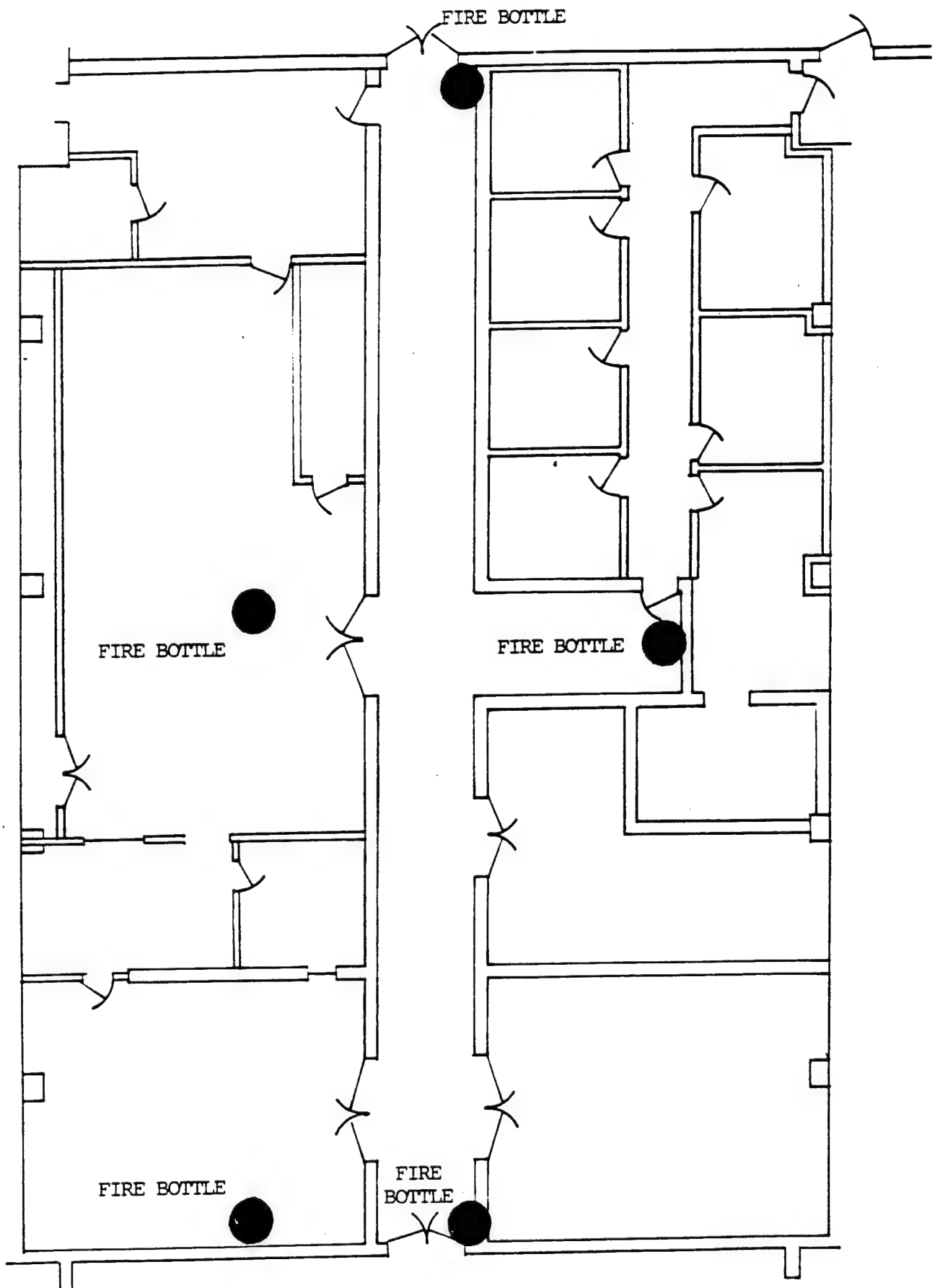


Figure 6. Fire Bottles.

If the capacitor banks were charged in preparation for a test immediately prior to a building power loss, the banks cannot be discharged. The operator or Facility manager must determine that all personnel are evacuated from the Facility and then must remain in the immediate area to warn any emergency personnel of the hazard of the charged capacitors. The capacitors will self-discharge over a period of about one hour.

Apparel and Personal

Although there is no specific dress code for the Tri-Service Thermal Radiation Test Facility, the following suggestions should be adhered to for safety.

Avoid high nylon content clothing as it tends to generate a static electrical charge that can have an effect on electronic equipment and could cause a spark that could cause ignition of handled solvents.

Neck-ties, string-ties, scarfs, other neck adornments and loose clothing, especially unsecured or blowsy sleeves, should not be worn when working with or around components in the Facility test areas or in the Facility work shop.

Loose jewelry, especially neck and wrist, should not worn around machinery or electronic devices. Rings and watches are to be removed whenever servicing high voltage equipment such as the capacitor banks or inside the Simulator Head. Large metal belt buckles, key and wallet chains, large earrings, and even metal glasses frames should be avoided when working around the high voltages present at the Facility.

Neoprene or rubber bottomed shoes are recommended for all areas of the Facility. Plastic soled shoes should not be worn at the Facility. Leather soled shoes are not recommended for areas such as the Work Shop or where water, oil, or hydraulic fluid may be present on the floor. A safety or steel-toed shoe should be worn when handling the gas bottles or working with heavy components that could fall to the floor.

Long hair should be tied back or covered to prevent loose hair being caught in machinery or making contact with electric components. Facial hair should be kept trimmed short for the same reason.

General

Ear protection should be worn whenever occupying the Data-Acquisition Room 710C (Figure 7) or the FTS/VSAL Control Room 701B (Figure 7) during operation of Wind Tunnels or when cooling the Flashlamp Thermal Simulator during a test.

Eye protection with a minimum #10 welding filter is used to observe a test but the energy source should never be viewed directly regardless of protection.

No personnel will occupy the Flashlamp Thermal Simulator/Vortek Stabilized Arc Lamp (FTS/VSAL) Room 711 (Figure 7) or the Nitrogen Cooling Bank Room 711B (Figure 7) when either the FTS or VSAL is being operated. There is the danger of flying glass from a ruptured lamp, high-pressure water from a ruptured hose, exposed high-voltage connections, corrosive chemical from a ruptured capacitor or hot metal sparks from an overheated component or test specimen. The FTS/VSAL Control Room 710B and the Data-Acquisition Room 710C may be occupied by a limited number of personnel during testing. The test may be observed through the smoked acrylic window between Room 710B and 711 but only with adequate filtered eye protection. The doorway between Room 710B and 711 must be kept clear of personnel during FTS/VSAL operation. The doorway between the FTS/VSAL Test Room 711 and the main hallway is interlocked preventing access to 711 from the hall whenever either the FTS or VSAL is energized. The doorway between 711 and the General Storage area Room 712 (Figure 7) is kept locked from the 711 side preventing access to 711 from 712 at any time.

No personnel will occupy the Quartz-Lamp Bank (QLB) Test Room 710 (Figure 7) when a test using any equipment in that room is being performed. There is the danger of flying glass from a ruptured lamp, high-pressure hydraulic fluid from a ruptured hose, hot metal sparks from an overheated component, flying debris from a failed specimen under mechanical load test, and exposed high-voltage connections. The doorway between the QLB Test Room 710 and the FTS/VSAL Control Room 710B as well as the doorway between 710 and the main hallway are electronically interlocked when a test is in progress in the QLB Test Room. Testing in Room 710 may be observed by a limited number of personnel from the Data Acquisition Room 710C through the acrylic window to Room 710. Properly filtered eye protection must be worn.

The emergency eye wash and emergency laboratory full-body shower (Figure 7) are located in the main hallway at the West end near the exit doors that have no windows.

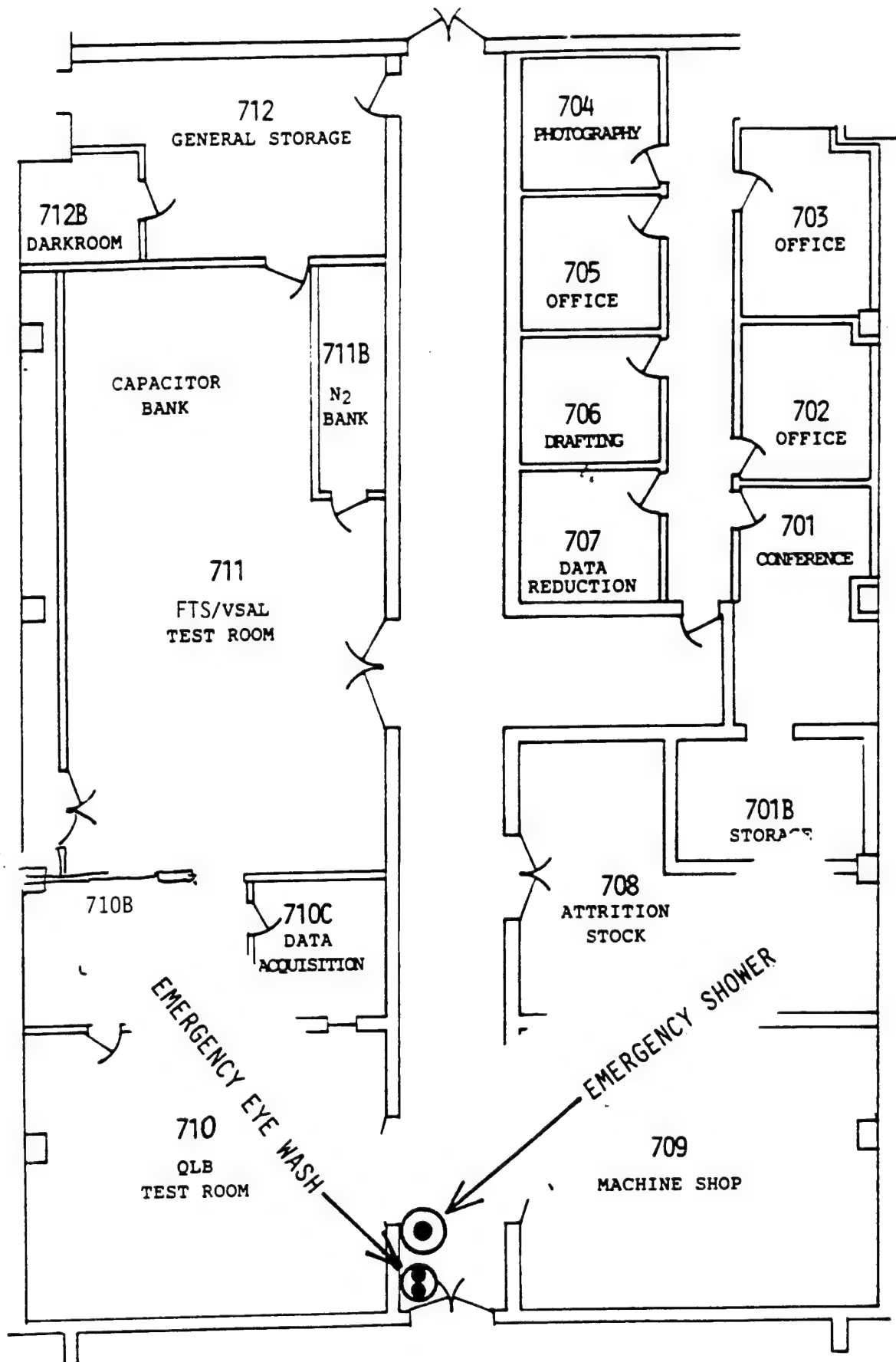


Figure 7. Emergency Eye Wash and Shower.

The eye wash is activated by a palm-press handle located below and to the right of the bowl and must be held down to cause the water to flow. The full-body shower is a flush type and the chain must only be pulled once to initiate flow. Both the eye wash and the body shower are inspected and checked for proper operation at least once weekly.

Signs have been posted on the Facility Attic access ladders in the West hall. Authorized personnel accessing the attic area are warned of the possible noise and light that could pass through the ceiling material causing distraction and possible balance loss to personnel in the attic area.

All full-time University of Dayton Research Institute personnel working at or assigned to the Tri-Service Thermal Flash Test Facility shall be trained in the technique of Cardiopulmonary resuscitation (CPR).

All chemicals and solvents including flammable paints will be stored in an approved cabinet in Attrition Stock Room 708.

Building 56 has been designed a "non-smoking" building by the Wright-Patterson Fire Control Division. The use of burning tobacco products is forbidden. Smoking areas are anywhere outside the building.

Machine Shop

The equipment and tools in the Facility Machine Shop are limited to use by authorized/trained personnel only. Sharp tools, sharp edges, hot materials, pinch points, flying metal chips, high-pitched noise, slippery floor due to oil, heavy tool and tool components all in part contribute to hazards in the Facility Machine Shop.

Eye protection, either safety glasses, goggle or face shields should be worn when using any of the power tools in the shop. Leather gloves should be worn when handling material that may have sharp edges, when changing a blade on the band-saw or welding a new band-saw blade, when changing a cutting tool in the lathe or milling machine or at any time where protection of hand and fingers is required. Leather or heat insulated gloves should be worn when handling materials that have been heated in the Blue M oven or with the torch, when polishing or sanding material that may be heated by the friction of the action, or when heated material of any kind must be handled.

Torches are limited in use to the fabrication of thermocouples, light brazing/soldering or heating material for other purpose and then should only be done in the Fume Hood when fumes can be exhausted to the outside. Dark filtered welding goggles should be used whenever heating material.

Belt guards/covers should be kept in place on the band-saw, drill press, lathe, belt sanders, and milling machine. The blade guard on the band-saw cover the exposed blade and should be kept in place and clear of foreign obstacles that could jam between the blade and guard. Turning speed on the lathe, drill press, and milling machine is changed by repositioning the belt on different diameter pulleys. All movement of the belt and pulleys must be completely stopped before the belt guards are removed for access to the belts and must be replaced after the change has been made.

During routine cutting, milling, or drilling operations in the machine shop a potentially slippery residue of oil, metal/material dust and chips can accumulate on the floor. Caution should be used when moving about in the shop when this residue is present and timely floor sweeping should be accomplished to prevent this condition when possible.

Some Shop operations generate high noise levels such as cutting thin metal material on the band-saw, turning hard metals on the lathe and sanding edges of thin materials. When these high noise levels are present, ear protection should be worn.

The Fume Hood should be used whenever sanding a material that may generate dust that could be hazardous such as fiberglass. The Hood should also be the point of use for the various types of torches used to heat materials that may give off smoke or other potentially hazardous fumes. The Fume Hood is not used for aerosol or spray painting of material but should be used when painting with a brush or roller or other painting means that does not generate an air-borne particle. All cleaning and preparation using solvents should be done in the Fume Hood. Some glues and epoxies give off hazardous fumes when curing and should be used in the Hood.

Whenever handling cleaning solvents or other potentially hazardous liquid materials, rubber apron and gloves should be worn and a full-face shield should cover from neck to forehead. Glass containers should be handled with both hands. When combining pourable materials, the more hazardous pours into the less hazardous thereby starting with a weak mixture that increases in strength as a function of continued pour.

Servicing

The Quartz Halogen Infra-Red Heater Lamps (Quartz Lamps) used as the thermal source with the Large Test Section Wind Tunnel (LTS/WT) are to be handled only by qualified Tri-Service Thermal Test Facility personnel. Before removing or changing Quartz Lamps the Quartz Lamp Bank primary disconnect (Figure 8) must be pulled down to its OFF position. Voltage measurements across each of the three phases and to ground are to be taken to assure no voltage is present. Cotton gloves and safety eyeglasses, goggles or face shield are to be worn when handling Quartz Lamps and when replacing the Wind Tunnel quartz window. The air hose is to be disconnected from the air cylinder when servicing any part of the shutter mechanism. The Wind Tunnel primary disconnects (Figure 8) are to be pulled down to their OFF position whenever the Wind Tunnel must be serviced or opened for cleaning.

When servicing the hydraulic system of the Hydraulic Mechanical Tester, the main disconnect (Figure 8) must be pulled down to its OFF position. At no time should hands be placed between the cylinders of the test apparatus even when the hydraulic system has been disarmed since there are pressure accumulators in the system that could hold enough pressure to actuate the cylinder. Since the hydraulic hoses and controlling cables for the Hydraulic Tester may lay on the floor around the test machine, care should be taken not to trip or to slip on the hydraulic oil that could be present on the floor.

When servicing the Vortek Stabilized Arc Lamp (VSAL), the main disconnect (Figure 8) must be pulled down to its OFF position. Great caution must be exercised when working on the VSAL and components should always be shorted to ground before touching, because inductors in the system are capable of holding a charge of electricity even though the main disconnect has been pulled OFF. The "Two-Man" system is mandatory, whereby one man is performing the necessary service while a second man, trained in CPR, observes and is prepared to take action to clear the first man of harm by body-block or grounding pole. Eye protection in the form of safety glasses, goggles, or face shields is to be worn by both men. Cooling water could be present on the floor around the VSAL creating a slippery footing condition. Hoses and cables create a possible tripping hazard and caution is advised.

There is no main safety disconnect for the Flash Lamp Simulator (FLS) but power can be cut to the capacitor charging system by opening circuit breakers 37, 39, and 41 on panel LP-2 (Figure 8) behind the false wall or by pulling the large plug (208V, 30,

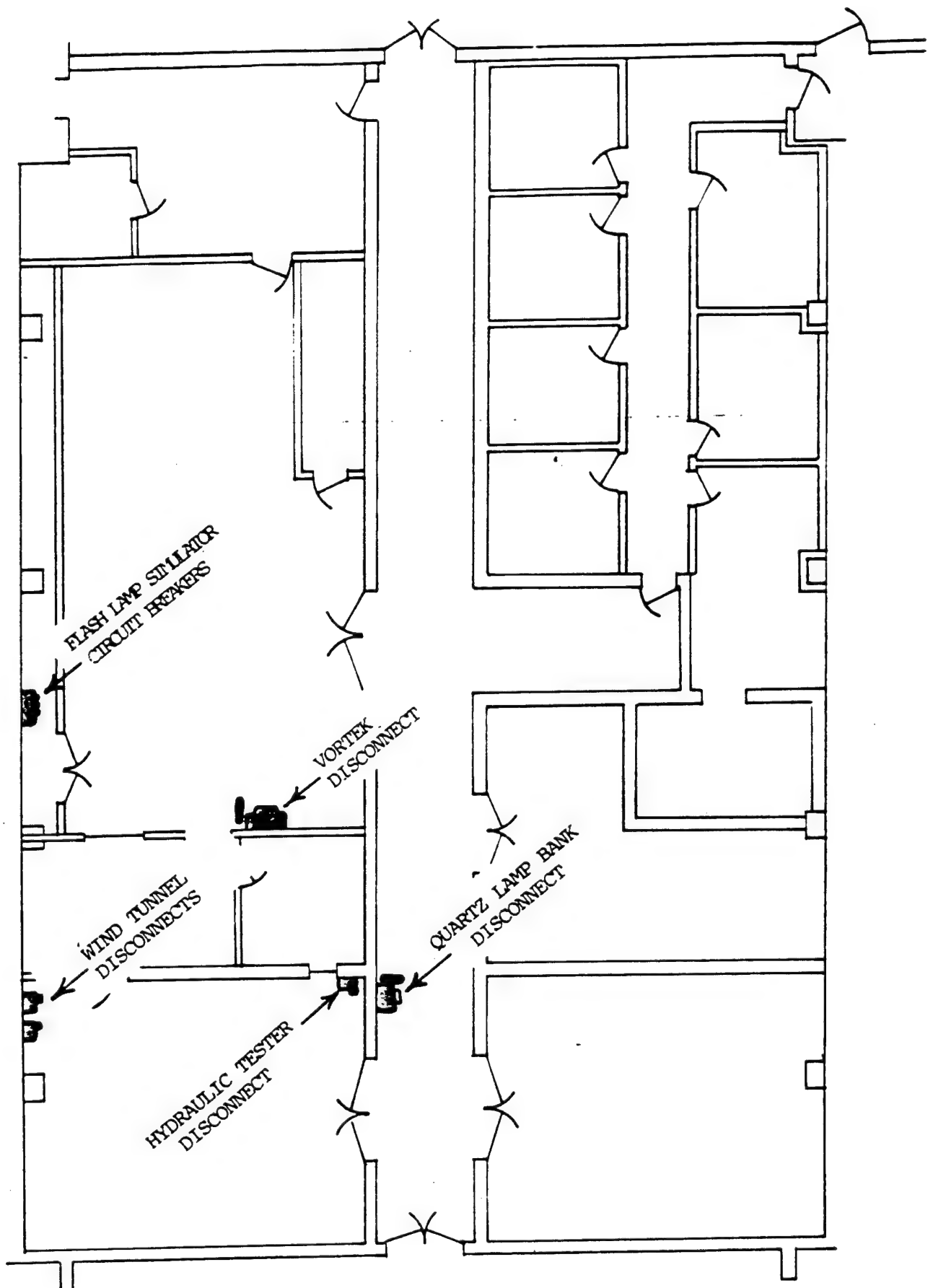


Figure 8. Disconnects.

50A) on the wall above the control console in the FLS control room. Note that neither of these actions in themselves will render the capacitor bank SAFE.

Access to the capacitor banks for repair or maintenance is limited to authorized, trained Facility personnel. An observer must be present when any work is performed on any part of the capacitor bank system or inside the Flash-Head cabinet. The observer must stand clear of all cabinet, frame, or other structures and must keep the accessing individual in sight at all times. The observer must be trained in the technique of cardiopulmonary resuscitation (CPR) and have available to him a grounded gaff with wooden handle to be used to separate the accessing individual from high voltage if necessary.

When accessing the inside of any capacitor bank or inside the Flash-Head cabinet, the accessing individual will refrain from wearing finger rings, metal watches or bracelets, metal neck adornments, and metal belt buckles. Tools will not be carried in pockets when they protrude from the pocket. Pens or pencils will be removed from breast pockets.

Before accessing the capacitor bank area the bank discharge relays must be activated for a minimum of 10 minutes. Before accessing a capacitor drawer, the output line must be jumpered to ground using a suitable grounding strap and finally the capacitor to be accessed will be shorted using a suitable jumper across its terminals.

Gas Bottles

Gas bottles will be moved only by trained, authorized Facility personnel and representatives of the supplier. Facility personnel will move only one bottle at a time when no cart is available; two bottles on a two-bottle cart only. Bottles will be stored in a special area where they may be properly secured in an upright position. When in storage, bottles may be grouped without securing each bottle individually but the group must fill the storage area with no open areas into which a bottle could lean or fall. When bottles are put on-line, each bottle will be secured by a chain attached to the wall and wrapping fully around the bottle at a point two-thirds of the bottles height.

Leather palm or other special bottle-handling gloves should be worn when moving gas bottles to improve grip and lessen possible damage to fingers or hands. Leather or safety shoes should be worn when moving gas bottles. Canvas or other soft

sided shoes such as tennis shoes or sneakers are not recommended wear for the manipulation of gas bottles.

Connecting/disconnecting gas bottles will be accomplished only by trained authorized Facility personnel. Eye protection in the form of safety glasses, goggles, or face shield must be worn when changing bottle fittings.

Material Safety Data Sheets

No material will be tested at the Tri-Service Thermal Test Facility until the Material Safety Data Sheets for all components of that material have been pursued by the Facility Manager and determined to be safe for testing at the conditions stipulated for the test.

B.3 CLASSIFICATION OF HAZARDOUS MATERIALS (per Department of Transportation [D.O.T.])

Hazardous Material - A substance or material which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety and property. (Part 172, 49 CFR, 171.8)

-
1. Flammable Liquid - Any liquid which, under specified test procedures, has a flashpoint or less than 100°F (37.8°C); e.g. crude oil, petroleum: ether; gasoline. (49 CFR, 173.115)
 2. Flammable Solid - Solids, other than explosives, which are likely to cause fire through absorption of moisture, through spontaneous chemical changes, or as a result of retained heat including spontaneously combustible or water - reactive material; e.g. charcoal briquettes; lithium metal; matches. (49 CFR, 173.150)
 3. Combustible Liquid - A liquid not meeting the definition of any other hazardous materials class having a flashpoint of 100°F (37.8°C) or more and less than 200°F (93.3°C); e.g. crude oil, petroleum; formaldehyde; Fuel oil. (49 CFR, 173.115)
 4. Corrosive Material - A liquid or solid that causes visible destruction or irreversible damage to skin tissue at the point of contact, or that has a severe corrosion rate on steel; e.g. phosphorus pentachloride, solid; potassium fluoride solution; sulfuric acid. (49 CFR, 173.240)

5. ORM-A (Other Regulated Materials) - A substance which has an irritating, noxious, anesthetic or similar property which would cause extreme annoyance or discomfort in the event of leakage; e.g. bone oil; carbon tetrachloride; dry ice. (49 CFR, 173.500)
6. Poison-B - Liquids or solids (including pastes and semisolids) known to be so toxic to man as to create a health hazard; or which are presumed to be toxic to man because of the effects on laboratory animals; e.g. arsenic; some insecticides; carbolic acid. (49 CFR, 173.343)
7. Oxidizer - A substance that yields oxygen readily to stimulate the combustion of certain other substances; e.g. ammonium nitrate mixed fertilizer; lead nitrate; lead peroxide. (49 CFR, 173.151)
8. Non-regulated - All other chemical material which does not meet D.O.T. hazardous materials requirements.
9. ORM-E - A hazardous material that is not in any other hazard classification but subject to D.O.T. regulations.
10. Radioactive - Those materials containing radioisotopes.

INSTRUCTIONS: SECTION B

SAFETY

Block 1: Enter sponsoring agency, date of submission and revision number ('original' if first submission).

Blocks 2 thru 10: Self explanatory. Attach Material Safety Data Sheets for each material to be tested.

Block 11: Test Facility Manager approval signature.

SECTION B: SAFETY

2. EXPERIMENT DESCRIPTION

1.

AGENCY _____

DATE _____

REVISION _____

3. EXPLOSIVES,
PROPELLANTS,
PYROTECHNICS, OR
FIRE HAZARDS
☐ YES
☐ NO

MATERIAL

MATERIAL SAFETY
DATA SHEET

CONFIGURATION

OF ITEMS

4. RADIOACTIVE
HAZARDS
☐ YES
☐ NO

MATERIAL

MATERIAL SAFETY
DATA SHEET

CONFIGURATION

OF ITEMS

5. ELECTRICAL
HAZARDS
☐ YES
☐ NO

SOURCE

VOLTAGE

AMPS

CONFIGURATION

OF ITEMS

6. TOXIC HAZARDS

☐ YES
☐ NO

MATERIAL

MATERIAL SAFETY
DATA SHEET

CONFIGURATION

OF ITEMS

7. OTHER HAZARDS

☐ YES
☐ NO

MATERIAL/SOURCE

MATERIAL SAFETY
DATA SHEET

CONFIGURATION

OF ITEMS

8. SAFETY POINT OF
CONTACT:

9. ADDRESS

10. PHONE NOS.

11. SIGNATURE

INSTRUCTIONS: SECTION C

1. UNCLASSIFIED VISITS:

Complete the enclosed Unclassified Visit Request form and forward copies as required for Classified visits.

2. CLASSIFIED VISITS:

- a. Your Security Supervisor should send the original of your clearance verification (not to exceed one year) on your company's normal form for Classified visits in accordance with ISM Paragraph 37d to:

2750 ABW/DNA
Bldg. 56, Bay 7, Area B
Wright-Patterson AFB, OH 45433-5000
ATTN: N. Olson

- b. A copy of the Visit Request Form must be sent to:

University of Dayton Research Institute
300 College Park Avenue
Dayton, OH 45469-0103
ATTN: M. Francina Lester, KL 521

- c. A copy of the Visit Request Form must be sent to:

Aeronautical Systems Div., Security Police
Area B, Bldg. 8, Room 102
Wright-Patterson AFB, OH 45433-6503
ATTN: Industrial Security

3. RESTRICTIONS:

- a. There is no storage provided for classified information at the Thermal Radiation Test Facility.
- b. If you have a local office, please make arrangements to store classified information there overnight.
- c. If you do not have a local office that can store classified information, the Wright-Patterson AFB Consolidated Command Post, Building 266, Area A,

Wright-Patterson AFB, Phone (513) 257-6314, may be used for storage of classified information. This service can only be used if the other above storage alternatives are not available.

- d. Your Visit Request should include all personnel from your organization that may have occasion to visit the Facility during the year.
- e. In lieu of your company's Security Chief (or representative) signing as "Authorized Representative" for Classified Visits, your division supervisor may sign for Unclassified Visits.
- f. When Visit Request Forms cannot be mailed one week in advance of the requested visit date, the original may be hand carried to the Facility BUT copies MUST be mailed to the other two addresses BEFORE the visit date.
- g. Questions may be directed to either Nick Olson, Facility Manager, at (513) 253-7166 or Fran Lester, Industrial Security at (513) 229-2115.

SECTION C: SECURITY
UNCLASSIFIED VISIT REQUEST

Date:	FROM: (Company name and address)
TO: 2750 ABW/DNA Bld. 56, Bay 7, Area B Wright-Patterson AFB, OH 45433-5000 Attn: N. Olson	

Authorization is hereby requested for the following employee(s) to visit your facility on an unclassified basis.
Approval assumed unless otherwise notified.

NAME AND TITLE	SOCIAL SECURITY NUMBER	CITIZENSHIP/ALIEN REGISTRATION NUMBER

DURATION OF VISIT (Not to exceed one year)
from _____ to _____

PURPOSE OF VISIT:

Prior verbal arrangements were made between:

Test Facility Representative _____ phone _____

Your Company's Representative _____ phone _____

_____ print Authorized Representative Security Chief	_____ signed	_____ phone
---	-----------------	----------------

**DISTRIBUTION LIST
DSWA-TR-96-33**

DEPARTMENT OF DEFENSE

DEFENSE ELECTRONIC SUPPLY CENTER
ATTN: DESC-E

DEFENSE INTELLIGENCE AGENCY
ATTN: OGA-4B2
ATTN: TWJ

DEFENSE SPECIAL WEAPONS AGENCY
4 CYS ATTN: ESA LTC O'SHAUGHNESSY
ATTN: ESA W SUMMA
2 CYS ATTN: TRC
ATTN: WE
ATTN: WEL
ATTN: WEP B PRASAD

DEFENSE TECHNICAL INFORMATION
2 CYS ATTN: DTIC/OCF

FC DEFENSE SPECIAL WEAPONS AGENCY
ATTN: FCT-RSET MAJ SCHLICHER
ATTN: FCTO
ATTN: FCTOS
ATTN: FCTT DR BALADI
ATTN: FCTTS J JABLONSKY
ATTN: FCTTS E MARTINEZ

DEPARTMENT OF THE ARMY

ADVANCED RESEARCH PROJECT AGENCY
ATTN: PMO

ARMY RESEARCH LABORATORIES
ATTN: TECH LIB
ATTN: ANSRL-WT-NB-MARY ABE

NUCLEAR EFFECTS DIVISION
ATTN: B HAMILTON
ATTN: J OKUMA
ATTN: STEWS-NE-A BRIONES
ATTN: STEWS-TE R PENNY

U S ARMY COLD REGION RES & ENG LAB
ATTN: TECHNICAL DIRECTOR

US ARMY ENGINEER DIV HUNTSVILLE
ATTN: HNDED-CS
ATTN: HNDED-SY

U S ARMY ENGR WATERWAYS EXPER STATION
ATTN: D RICKMAN, CEWES-SE-R
ATTN: J WINDHAM, CEWES-SD-R
ATTN: TECHNICAL LIBRARY

USA NATIONAL GROUND INTELLIGENCE CTR
ATTN: IAFSTC-RMT

U S ARMY NUCLEAR & CHEMICAL AGENCY
ATTN: G LONG

U S ARMY RESEARCH LAB
ATTN: AMSRL-SL-CM E FIORAVANTE
ATTN: AMSRL-WT-NC R LOCKS
ATTN: AMSRL-WT-NC R LOTTERO
ATTN: AMSRL-WT-NC/C MERMAGAN
ATTN: AMSRL-WT-NC/S J SCHRAML
ATTN: SLCBR-SS-T (TECH LIBRARY)
ATTN: SLCBR-TBD-B R PEARSON

U S ARMY SPACE STRATEGIC DEFENSE CMD
ATTN: CSSD-CS
ATTN: CSSD-SA-E

U S ARMY TRADOC ANALYSIS CTR
ATTN: ATRC-WSSR

U S ARMY THAAD PROJECT OFFICE
ATTN: CSSD-H-SA

DEPARTMENT OF THE NAVY

DAVID TAYLOR RESEARCH CENTER
ATTN: P POTTER
ATTN: S BARTON

NAVAL RESEARCH LABORATORY
ATTN: CODE 5227 RESEARCH REPORT
ATTN: CODE 5584 E FRIEBELE
ATTN: CODE 6180
ATTN: J GRUN

NAWC-WD
ATTN: CODE 473320D HERIGSTAD

NRAD ACTIVITY PACIFIC
ATTN: CODE 250

DEPARTMENT OF THE AIR FORCE

HQ 497 IG/INOT
ATTN: INT

DEPARTMENT OF ENERGY

LOS ALAMOS NATIONAL LABORATORY

ATTN: D FRY MS C914
ATTN: D STUPIN, MS C914
ATTN: J FRITT MS P962
ATTN: J ZAHRT MS F669
ATTN: L BRYANT MS C914
ATTN: M THOMPSON MS D410
ATTN: MS P364 REPORT LIBRARY
ATTN:MS218 P WHALEN
ATTN: P GINSBERG
ATTN: S S HECKER
ATTN: W BRUNISH MS-F659

SANDIA NATIONAL LABORATORIES

ATTN: B PLUMMER/S-0175
ATTN: C CAMERON/MS 0153
ATTN: MS 1159/W H BARRETT
ATTN: TECH LIB

OTHER GOVERNMENT

CENTRAL INTELLIGENCE AGENCY
ATTN: OSWR/NED 5S09 NHB

FEDERAL EMERGENCY MANAGEMENT
ATTN: OFC OF CIVIL DEFENSE

DEPARTMENT OF DEFENSE CONTRACTORS

ABERDEEN RESEARCH CENTER
ATTN: N ETHERIDGE

APTEK, INC.
ATTN: S SUTHERLAND

BERKELEY RSCH ASSOCIATES, INC.
ATTN: J ORENS

BOEING TECHNICAL & MANAGEMENT SVCS, INC
ATTN: R BRYAN CARINS

CARPENTER RESEARCH CORP
ATTN: H J CARPENTER

CHARLES NEEDHAM
ATTN: CHARLES NEEDHAM

DAYTON UNIVERSITY
2 CY ATTN: NICHOLAS J OLSON

DAYTON, UNIVERSITY
ATTN: B WILT
ATTN: R SERVAIS

GEO CENTERS, INC.
ATTN: E MARRAM

GEORGIA INSTITUTE OF TECHNOLOGY
ATTN: EES/EMSL/SOLAR SITE C BROWN

H & H CONSULTANTS, INC.
ATTN: W HALL

INFORMATION SCIENCE, INC.
ATTN: W DUDZIAK

JAYCOR
ATTN: J BRYARS

JAYCOR
ATTN: CYRUS P KNOWLES

KAMAN SCIENCES CORP
ATTN: D CAYNE
ATTN: LIBRARY

KAMAN SCIENCES CORP
ATTN: A L PHILLIPS
ATTN: G PADEREWSKI
ATTN: J FANNING
ATTN: T DEUTON
ATTN: Z LAWRENCE

KAMAN SCIENCES CORP
ATTN: D MOFFETT

KAMAN SCIENCES CORP
ATTN: DASIAC

KARAGOZIAN AND CASE
ATTN: J KARAGOZIAN

LOCKHEED MARTIN CORPORATION
ATTN: S SALISBURY

LOCKHEED MARTIN CORPORATION
ATTN: TECH INFO CTR D/COLL

LOGICON R AND D ASSOCIATES
ATTN: C K B LEE

ATTN: D SIMONS
ATTN: J DRAKE
ATTN: LIBRARY

LOGICON R AND D ASSOCIATES
ATTN: G GANONG

MAXWELL LABORATORIES INC.
ATTN: J BARTHEL
ATTN: T PIERCE

MISSION RESEARCH CORP
ATTN: TECH LIBRARY

MISSION RESEARCH CORP.
ATTN: D OHARA
ATTN: K WOODS

NICHOLS RESEARCH CORPORATION
ATTN: R BYRN
ATTN: STANLEY R BERRY

PACIFICE-SIERRA RESEARCH CORP
ATTN: H BRODE

PRIMEX PHYSICS INTERNATIONAL
ATTN: E WILLIS

SCIENCE APPLICATIONS INTL CORP
ATTN: TECHNICAL REPORT SYSTEM

SCIENCE APPLICATIONS INTL CORP
ATTN: J GUEST
ATTN: J SIMMONS
ATTN: W SCHAEFER

SCIENCE APPLICATIONS INTL CORP
ATTN: J COCKAYNE
ATTN: W CHADSEY
ATTN: W LAYSON

SCIENCE APPLICATIONS INTL CORP
ATTN: G BINNINGER

SRI INTERNATIONAL
ATTN: DR JIM GRAN
ATTN: G GREENFIELD

TELEDYNE BROWN ENGINEERING
ATTN: J RAVENSCRAFT
ATTN: MS-12 TECH LIB (P SHELTON)

THE AEROSPACE CORP
ATTN: L SELZER M4/925
ATTN: LIBRARY ACQUISITION M1/199

THE BDM CORPORATION OF SAUDIA ARABIA
ATTN: E DORCHAK

TITAN CORPORATION
ATTN: J THOMSEN

TRW SPACE & DEFENSE SECTOR SPACE &
TECH GROUP
ATTN: OUT6/W WAMPLER